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08/319,411 10/06/94 NIELSEN

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EXAMINER

MARSCHER, A

ART UNIT

PAPER NUMBER

1631

35

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/319,411

Applicant(s)
Nielsen et al.

Examiner
Ardin Marsch I

Group Art Unit
1631



☒ Responsive to communication(s) filed on Sep 8, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1, 5, 8-10, 12, 13, 15, 20, 22-24, 30-33, 37, and 39-50 is/are pending in the applicat

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1, 5, 8-10, 12, 13, 15, 20, 22-24, 30-33, 37, and 39-50 is/are rejected.

☒ Claim(s) 2-4, 6, 7, 11, 14, 16-19, 21, 25-29, 34-36, and 38 have been canceled. ~~are objected to.~~

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☒ Interview Summary, PTO-413 (2 copies)

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

Serial No. 08/319,411

- 2 -

Art Unit: 1631

Applicants' arguments and submission of the Declaration, filed 9/8/00, has overcome the previous rejections of record. Applicants therefore do not need to respond further to said previous rejections of record. However, a reconsideration of the instant application has revealed the below summarized new grounds of rejection. Due to the application of these new grounds of rejection, the finality of the office action, mailed 4/18/00, is hereby withdrawn and prosecution is reopened.

Applicants' arguments, filed 9/8/00, have been fully considered and they are deemed to be persuasive to overcome the previous rejections of record. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are newly applied. They constitute the complete set presently being applied to the instant application.

Claims 8-10, 12, 13, 15, 20, 22-24, 30-33, 37, and 39-50 are rejected, as discussed below, under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 37, line 17, the limitation " R^{13} is a conjugate" is present. In claim 37, line 18, the parameter "a" is 0 or 1. In claim 37, line 6, L and L_m are defined in terms of R groups and the parameter "a". These limitations confusingly conflict in

that the defining of R^{13} being a conjugate is a positive limitation on the content of the L groups, but, in conflict, the parameter "a" may be 0 or 1. In order for an L group to contain R^{13} the parameter "a" seems to be constrained to be "1". What is meant therefore by requiring a content for R^{13} and then permitting parameter "a" to be 0 which would result in no " R^{13} " in the L group? Clarification is requested via clearer claim wording as to what is meant by parameter "a" being 0 when R^{13} is positively given as a conjugate. It is suggested to amend the limitation regarding R^{13} such that it is present in an L group only when "a" = 1, or, alternatively, amending the phrase "if present" into the definition for R^{13} . Claims 8-10, 12, 13, 15, 20, 22-24, 30-33, and 39-50 also contain this unclarity either directly or via dependence from a claim which contains the unclarity.

Claims 24 and 33 are rejected under 35 U.S.C. § 112, fourth paragraph, as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Since R^{13} is already a conjugate in claim 50, the dependence of claim 24 from claim 50 results in this limitation not further limiting the R^{13} practice which already is required in claim 50. This same issue is present in claim 33 compared to claim 30 from which it depends.

The following is a quotation of 35 U.S.C. § 103(a) which

forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103(a).

Claims 1, 5, 8-10, 12, 13, 15, 20, 22-24, 30-33, 37, 39-43, 45, 46, 48, and 50 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shah et al. (P/N 5,705,333).

Shah et al. is directed to PENAMs which are nucleic acid based mimics. These PENAMs are summarized in columns 2-5 as being inclusive of chemicals with peptide backbones, which are termed PNAs in the art. They include peptide backbone polymer and monomer species with side chains having nucleobases as are normally found in nucleic acids. The peptide backbones are made up of, optionally, amino acids as described in column 6, lines 60-64. Amino acid backbone structures of the L or D stereoisomer

type as options are specifically described in column 7, lines 37-60. Figures 4A through 8 of the reference depict PNA chemical structures which are also species of PNA structures of the instantly claimed PNA molecules. The reference also describes the further introduction of functional groups into the basic PENAM structure in column 19, lines 17-50, to result in a conjugate as instantly claimed. In column 19, lines 21-26, these functional groups are cited as being appended either at the N-terminus or the C-terminus or at an intervening position. One of these functional groups is described as being one of various crosslinking groups, which appears to be a moiety which performs as the "crosslinking agent" of instant claim 1, line 12, as well as the linking moiety of instant claim 8. Another of these appendable functional groups is described as an alkylating agent in said column 19 citation. Yet another such appendable group is a cleaving group which may cleave nucleic acid as described in the bridging paragraph between columns 19 and 20 of Shah et al. EDTA is also an appendable moiety therein described which also serves as a metal chelator as cited in instant claim 5, line 14. Consideration of the definition of "conjugate" on page 15 of the instant specification reveals a reporter as being included. It is noted that a nucleobase qualifies as a reporter due to the well known UV detectability of such nucleobases and thus suggests the R¹² conjugate practice of instant claim 37, for example, or

of instant claims 9 and 10 (for instant claim 10, R^{12} may be hydrogen and R^{13} is a nucleobase. A nucleobase is also an aromatic lipophilic moiety as also within said page 15 listing of conjugates. Thus, species of PENAMs with functional groups attached or tethered thereto which are PNA type conjugates of the instant claims are described in Shah et al. In order to clarify that the PENAMs of Shah et al. contain PNA structures as instantly claimed, the following comparison reveals common structural features. In Shah et al. in columns 7-8 the moieties that make up the PENAMs therein are described in significant detail. The moieties in Shah et al. are compared to corresponding moieties in instant claim 37 regarding the respective PNA structures as follows: In claim 37, line 3, a formula is shown with a monomer segment within the parenthesis therein with subparts designated by capital letters with the monomer number given by the parameter "m". Firstly, the number of monomers in the compound of said claim 37 is defined by $m + 1$, or 2 to 51. In Shah et al. the number of monomers in the PENAMs is given in column 12, line 22-23 as strings of monomers which is reasonably interpreted to suggest a plurality or two monomers at least. Various lengths of such strings are further described in column 12, line 36, through column 13, line 17, as being 9-25 monomers or "typically 10 to 25 bases" as given in column 13, line 11. Thus, there is clearly overlap between the monomer

number of instant claim 37 and that of Shah et al. Getting back to the basic structure, the following correspondences exist between the monomers of instant claim 37 and the PENAMs of Shah et al. as given in columns 7-8 therein.

claim 37	PENAMs	common structure therein
C _m	S1	alkyl
B _m	E-Y	N or N-alkyl
A _m	S3	alkyl or amide
L _m	B	nucleobase
D _m	S2	alkyl
G _m	C(=X)-N(-W)	amide or thioamide

Therefore, in summary, the instantly claimed PNA conjugate is also a specie of the Shah et al. PENAMs with a tethered agent moiety as described above.

Additionally, specific instant claims are also reasonably interpreted as being obvious species within Shah et al. as follows: Instant claim 39 requires at least one of the three R groups in its last line as being a conjugate. It is noted that one of these groups is R³ which is present in the G moiety of the structure therein. This G moiety corresponds to N(-W)C(=O) of the PENAMs. The instant R³ on the G moiety corresponds to W of the PENAMs. W may be a spacer group as given in column 7, line 11, of Shah et al. Certain spacer groups may be conjugates such as the disulphide which is a common site for crosslinking as well

as the ether or hydrazine spacers thus suggesting a specie of instant claim 39. Instant claim 40 also requires that at least one of 4 R groups be a conjugate at the end of claim 40. These R groups cited in the last line of claim 40 are at the termini of the PNAs. It has already been noted above that conjugate moieties are described in Shah et al. as being optionally attached at such termini thus suggesting species of claim 40. Instant claims 41 or 45 require that at least one of 5 R groups be a conjugate at the end of claims 41 or 45. One of these R groups is R^3 which is present in the G moiety which has been already described above as being a conjugate group when it is present in PNAs of instant claim 39 and now also claims 41 and 45. Claims 42 and 50 require R^3 or F to be or contain a conjugate which is present in the F moiety of instant claims 42 and 50 which has already been described above as being a terminally attached conjugate for PENAMs. Instant claim 43 requires that either one A or B moiety contain a conjugate. It is noted that E-Y of the PENAMs of Shah et al. includes Y being a conjugate as noted above regarding its being a spacer such as a disulphide or hydrazine, for example. The required conjugates of instant claims 46 and 48 are supplied in spacer groups of PENAMs as noted above for disulphides or hydrazine moieties.

Thus, it would have been obvious to someone of ordinary skill in the art at the time of the instant invention to practice

species of the Shah et al. PENAMs with functional groups attached thus resulting in species of the instant invention. It is noted that clearly described species within a generic disclosure such as Shah et al. are both motivated and suggested for the purposes of 35 U.S.C. § 103(a) obviousness.

Claims 8-10, 15, 20, 22-24, 30-33, 37, 40, 41, and 45-50 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lobberding et al. (P/N 5,623,049).

Lobberding et al. describes a series of nucleobase containing polymers which include the PNA structures of the instant claims and also contain crosslinking agents in the form of lysine or cystsine (Cysteine) in the backbone, as well as nucleobase reporter molecule conjugates in the B moiety therein equivalent to the instantly claimed L moieties. This form of polymer is described in columns 2-3 wherein R is an attached moiety to either E or G in the backbone. Options for R are listed in column 2 as including Lysine or Cystsine, both of which are well known to be sites for attachment via crosslinking to other molecules. Thus, species within the generic listings of Lobberding et al. are also within the instant claims as PNAs with conjugate containing backbones. Monomeric forms for this structure as also present in Lobberding et al. in columns 3-4.

Thus, it would have been obvious to someone of ordinary skill in the art at the time of the instant invention to practice

species of the Lobberding et al. with functional groups attached thus resulting in species of the instant invention. It is noted that clearly described species within a generic disclosure such as Shah et al. are both motivated and suggested for the purposes of 35 U.S.C. § 103(a) obviousness.

The non-statutory double patenting rejection, whether of the obviousness-type or non-obviousness-type, is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent. *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); and *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(b) and (c) may be used to overcome an actual or provisional rejection based on a non-statutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.78(d).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 5, 8-10, 12, 13, 15, 20, 22-24, 30-33, 37, 39-43, and 45-50 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 5,539,082. Although the conflicting claims are not identical, they are not patentably distinct from each other because various embodiments in each set of claims are common embodiments between said sets of claims. For example, claims 1 and 2 of the Patent include PNAs with

lysine at one terminus. It is well known that Lysine is a crosslinking agent in various biomolecules, such as protein as a result of its amino side chain. This is also an embodiment of instant claims 1, 40, and 50, for example, wherein a crosslinking agent at a terminus of a PNA is a specie therein. It is also noted that instant claim 5 includes a conjugate bound to a tether which tethers a nucleobase. If a terminal nucleobase containing PNA moiety is the tethered nucleobase and the penultimate PNA monomer moiety contains a nucleobase this is within the definition of a conjugate which is a "reporter molecule" as given in instant claim 5. Such PNAs are also species of claims 1 and 2 of the Patent. Instant claims 30-33 require either an L or R3 to be a conjugate. It is noted that a conjugate includes a reporter molecule which includes a nucleobase which is well known, as well as commonly utilized, for UV detectability. Similarly, instant claims 37 and 39 includes such species as described above with more specific PNA chemical structure thus also supporting this rejection over the Patent. It is noted that instant claims 39 and 49 require an R group on the linkage to the nucleobase to be a conjugate. Such R groups are given in the Patent in that alkylthio or amino groups are present as options which are well known crosslinking agent sites. Instant claims 41, 47, and 48 require a conjugate at certain R groups which includes linkages in the backbone of the PNA. Such conjugates may be crosslinking

agents as in an amino acid side chain such as lysine which is a side chain embodiment given as R⁷' in claims 1 and 2 of the Patent thus documenting a common embodiment. Instant claims 42 and 43 are directed to a monomer as is claim 3 of the Patent wherein at least the R group or some group on the nucleobase attachment must be a conjugate which includes crosslinking agents such as alkylthio or amino moieties which are also options in the nucleobase attachments of the Patent claim 3. Instant claims 45 and 46 require a conjugate on the C or D groups which has been noted above as being a specie of the Patent claims via the options of amino acid side chains being at said R⁷'.

Claims 1, 5, 8-10, 12, 13, 15, 20, 37, 39-41, and 47-49 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 5,773,571. Although the conflicting claims are not identical, they are not patentably distinct from each other because various embodiments in each set of claims are common embodiments between said sets of claims. For example, claim 1 of the Patent include PNAs with various biomolecules at one terminus. It is well known that certain of these biomolecules are a crosslinking agent, such as peptides or proteins, as a result of their amino acid side chain content. This is also an embodiment of instant claims 1 and 40, for example, wherein a crosslinking agent at a terminus of a PNA is a specie therein.

It is also noted that instant claim 5 includes a conjugate bound to a tether which tethers a nucleobase. If a terminal nucleobase containing PNA moiety is the tethered nucleobase and the penultimate PNA monomer moiety contains a nucleobase this is within the definition of a conjugate which is a "reporter molecule" as given in instant claim 5. Such PNAs are also species of claim 1 of the Patent. Similarly, instant claims 37 and 39 includes such species as described above with more specific PNA chemical structure thus also supporting this rejection over the Patent. It is noted that instant claims 39 and 49 require an R group on the linkage to the nucleobase to be a conjugate. Such R groups are given in the Patent in that alkylthio or amino groups are present as options which are well known crosslinking agent sites. Instant claims 41, 47, and 48 require a conjugate at certain R groups which includes linkages in the backbone of the PNA. Such conjugates may be crosslinking agents as in an amino acid side chain such as lysine which is a side chain embodiment given as R⁷ in claim 1 of the Patent thus documenting a common embodiment.

Claim 50 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 5, and 8 of U.S. Patent No. 5,786,461. Although the conflicting claims are not identical, they are not patentably distinct from each other because various embodiments in each set

of claims are common embodiments between said sets of claims. For example, claim 1 of the Patent include PNAs with various side chains off the backbone, which include lysine side chains which are well known to be crosslinking agents, as well as a reporter molecule as an L group. A reporter molecule is instantly included as a conjugate. Instant claim 50 includes reporter molecules as the L group in the basic PNA structures therein which includes the structure of claim 1 of the Patent.

Claims 8-10, 15, 20, 30-33, 37, 40, 41, and 47-49 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 9 of U.S. Patent No. 5,719,262. Although the conflicting claims are not identical, they are not patentably distinct from each other because various embodiments in each set of claims are common embodiments between said sets of claims. For example, claims 1 and 9 of the Patent include PNAs with various side chains off the backbone, which include lysine side chains which are well known to be crosslinking agents, as well as a reporter molecule as an L group. A reporter molecule is instantly included as a conjugate via the nucleobase therein as an L group. These claims of the Patent also contain the basic PNA structure, which similar to the above rejections are summarized as also being in the instant claims. The Patent claims also include reporter molecules as the L group in the basic PNA structures

therein which includes species of the instant claims which also require this. It is lastly noted that Lysine, which is a crosslinking agent, is an option of claim 1 of the Patent which is also a specie of instant claim 40.

Claims 8-10, 15, 20, 30-33, 37, 40, 41, and 47-49 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 4, 5, 9, and 40 of copending application Serial No. 08/108,591. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following common embodiments between the claims of the copending application and the instant application summarized as follows: Claims 4, 5, 9, and 40 of the copending application include PNAs with various side chains off the backbone, which include lysine side chains which are well known to be crosslinking agents, as well as a reporter molecule as an L group. A reporter molecule is instantly included as a conjugate via the nucleobase therein as an L group. These claims of the copending application also contain the basic PNA structure, which similar to the above rejections are summarized as also being in the instant claims. The copending application claims also include reporter molecules as the L group in the basic PNA structures therein which includes species of the instant claims which also require this. It is lastly noted that Lysine, which is a crosslinking agent, is a

terminus option of claims 4, 5, and 9 of the copending application which is also a specie of instant claim 40.

This is a *provisional* obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1, 5, 8-10, 12, 13, 15, 20, 37, 39-41, and 47-49 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 2, 6, 7, 9, 22, 24, 25, 27, 35, 37-39, and 44 of copending application Serial No. 08/275,951; taken in view of Switzer et al. (Bioch. 32:10489[1993]). Although the conflicting claims are not identical, they are not patentably distinct from each other because various embodiments in each set of claims are common embodiments between said sets of claims. For example, claim 1 of the copending application include PNAs with various biomolecules at one terminus, but requiring at least one C-pyrimidine as an L group. It is well known that certain of these biomolecules are a crosslinking agent, such as peptides or proteins, as a result of their amino acid side chain content. This is also an embodiment of instant claims 1 and 40, for example, wherein a crosslinking agent at a terminus of a PNA is a specie therein. It is also noted that instant claim 5 includes a conjugate bound to a tether which tethers a nucleobase. If a terminal nucleobase containing PNA moiety is the tethered nucleobase and the penultimate PNA

monomer moiety contains a nucleobase this is within the definition of a conjugate which is a "reporter molecule" as given in instant claim 5. Such PNAs are also species of claim 38 of the copending application. Similarly, instant claims 37 and 39 includes such species as described above with more specific PNA chemical structure thus also supporting this rejection over the copending application. It is noted that instant claims 39 and 49 require an R group on the linkage to the nucleobase to be a conjugate. Such R groups are given in the copending application claims in that alkylthio or amino groups are present as options which are well known crosslinking agent sites. Instant claims 41, 47, and 48 require a conjugate at certain R groups which includes linkages in the backbone of the PNA. Such conjugates may be crosslinking agents as in amino or alkylthio groups that are cited as options for the backbone R groups in claim 38 of the copending application thus documenting a common embodiment. The remaining claims of the copending application are included herein as they include a basic PNA polymer as also claimed in claim 38 of 08/275,951. The equivalent substitution of C-pyrimidine nucleobase for other nucleobases, such as in the instant claims, is lacking in 08/275,951 but Switzer et al. clearly describe the equivalence of such nucleobases in the abstract and the document as a whole. Such functional equivalents are deemed thus suggested and motivated thereby for documenting the common

embodiments between the instant claims and those of 08/275,951.

This is a *provisional* obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 22-24, 45, 46, and 50 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 8, 34, 35, 37, 40-47, 49-51, 53-56, 61-63, 66-69, 71-76, and 89-93 of copending application Serial No. 08/468,719. Although the conflicting claims are not identical, they are not patentably distinct from each other because various embodiments in each set of claims are common embodiments between said sets of claims. For example, claim 49 of the copending application include PNAs with various side chains off the backbone, which include alkylthio or amino side chains which are well known to be crosslinking agents, as well as a reporter molecule as an L group. A reporter molecule is instantly included as a conjugate. Instant claims 22-24, 45, 46, and 50 includes reporter molecules as the L group in the basic PNA structures as well as backbone conjugate moieties as noted above which therefore includes the structure of claim 49 of the copending application. The remaining claims of the copending application are included herewith due to their being limited to basic normal PNA components which are also those of the instant claim.

This is a *provisional* obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1, 5, 8-10, 15, 20, 30-33, 37, 40, 41, and 47-49 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 5, and 13 of copending application Serial No. 08/686,114; taken in view of Summerton et al. (WO 86/05518). Although the conflicting claims are not identical, they are not patentably distinct from each other because various embodiments in each set of claims are common embodiments between said sets of claims. For example, claim 1 of the copending application include PNAs with Lysine at one terminus, but requiring one 2,6-diaminopurine as an L group. It is well known that Lysine is a crosslinking agent, such as when present in peptides or proteins. This is also an embodiment of instant claims 1 and 40, for example, wherein a crosslinking agent at a terminus of a PNA is a specie therein. It is also noted that instant claim 5 includes a conjugate bound to a tether which tethers a nucleobase. If a terminal nucleobase containing PNA moiety is the tethered nucleobase and the penultimate PNA monomer moiety contains a nucleobase this is within the definition of a conjugate which is a "reporter molecule" as given in instant claim 5. Such PNAs are also species of the claims of the copending application.

Similarly, instant claims 37 and 39 includes such species as described above with more specific PNA chemical structure thus also supporting this rejection over the copending application. Instant claims 41, 47, and 48 require a conjugate at certain R groups which includes linkages in the backbone of the PNA. Such conjugates may be crosslinking agents as in alkylamine groups that are cited as options for the backbone R groups in claim 1 of the copending application thus documenting a common embodiment. The remaining claims of the copending application are included herein as they include a basic PNA polymer as also claimed in claim 1 of 08/686,114. The equivalent substitution of a 2,6-diaminopurine nucleobase for other nucleobases, such as in the instant claims, is lacking in 08/686,114 but Summerton et al. clearly describe the equivalence of such nucleobases in the abstract and the document as a whole. Such functional equivalents are deemed thus suggested and motivated thereby for documenting the common embodiments between the instant claims and those of 08/686,114. Summerton et al. (WO 86/05518) motivates and suggests that nucleobases for PNAs include 2,6-diaminopurine on page 20, line 30, through page 21, line 7, and specifically motivates such a base type for stronger base pair bonding for adjusting PNA affinity on page 48, lines 1-22, if desired. Thus, it would have been obvious to someone of ordinary skill in the art at the time of the instant invention to substitute such

nucleobases for natural nucleobases within the PNA oligomer practice of the instant application; thus resulting in the practice of the claims of the copending application. A specific motivation for stronger base pair bonding is hereby pointed to on page 48 of Summerton et al. (WO 86/05518), as desired for PNA design.

This is a *provisional* obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1, 5, 8-10, 12, 13, 15, 20, 37, 39-41, and 47-49 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 2, 6, 7, 34, 35, 38, 40, and 42 of copending application Serial No. 08/765,798; taken in view of Switzer et al. (Bioch. 32:10489[1993]). Although the conflicting claims are not identical, they are not patentably distinct from each other because various embodiments in each set of claims are common embodiments between said sets of claims. For example, claim 40 of the copending application include PNAs with various biomolecules at one terminus, but requiring at least one C-pyrimidine as an L group. It is well known that certain of these biomolecules are a crosslinking agent, such as peptides or proteins, as a result of their amino acid side chain content. This is also an embodiment of instant claims 1 and 40, for

example, wherein a crosslinking agent at a terminus of a PNA is a specie therein. It is also noted that instant claim 5 includes a conjugate bound to a tether which tethers a nucleobase. If a terminal nucleobase containing PNA moiety is the tethered nucleobase and the penultimate PNA monomer moiety contains a nucleobase this is within the definition of a conjugate which is a "reporter molecule" as given in instant claim 5. Such PNAs are also species of claim 40 of the copending application.

Similarly, instant claims 37 and 39 includes such species as described above with more specific PNA chemical structure thus also supporting this rejection over the copending application. It is noted that instant claims 39 and 49 require an R group on the linkage to the nucleobase to be a conjugate. Such R groups are given in the copending application claims in that alkylthio or amino groups are present as options which are well known crosslinking agent sites. Instant claims 41, 47, and 48 require a conjugate at certain R groups which includes linkages in the backbone of the PNA. Such conjugates may be crosslinking agents as in amino or alkylthio groups that are cited as options for the backbone R groups in claim 40 of the copending application thus documenting a common embodiment. The remaining claims of the copending application are included herein as they include a basic PNA polymer as also claimed in claim 40 of 08/765,798. The equivalent substitution of C-pyrimidine nucleobase for other

nucleobases, such as in the instant claims, is lacking in 08/765,798; but Switzer et al. clearly describe the equivalence of such nucleobases in the abstract and the document as a whole. Such functional equivalents are deemed thus suggested and motivated thereby for documenting the common embodiments between the instant claims and those of 08/765,798.

This is a *provisional* obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1, 5, 8-10, 12, 13, 15, 20, 22-24, 30-33, 37, and 39-50 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 24, 26, and 28 of copending application Serial No. 09/106,667. Although the conflicting claims are not identical, they are not patentably distinct from each other because various embodiments in each set of claims are common embodiments between said sets of claims. For example, claim 28 of the copending application include PNAs with various side chains off the backbone, which include alkylthio or amino side chains which are well known to be crosslinking agents, as well as a reporter molecule as an L group. A reporter molecule is instantly included as a conjugate. The instant claims includes reporter molecules as the L group in the basic PNA structures as well as backbone conjugate moieties as noted above which

therefore includes the structure of claim 28 of the copending application. The remaining claims of the copending application are included herewith due to their being limited to basic normal PNA components which are also those of the instant claim.

This is a *provisional* obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

No claim is allowed.

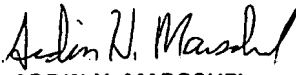
Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The CM1 Fax Center number is either (703) 308-4242 or (703) 305-3014.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ardin Marschel, Ph.D., whose telephone number is (703) 308-3894. The examiner can normally be reached on Monday-Friday from 8 A.M. to 4 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, can be reached on (703) 308-4028.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technical Center receptionist whose telephone number is (703) 308-0196.

October 18, 2000


ARDIN H. MARSCHEL
PRIMARY EXAMINER